APPENDIX D

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Input:    A continuous variable $x$ of dimension $m$ x $1$
Output:   1. A flag indicating whether the input vector is exponentially distributed
                 H = 1 : yes;     H = 0 : no
          2. The mean value meanv and minimum value minv of the sample
Process:
    $n = 51$                 // sample size
    $x1 = [0:1/(n-1):1]$     // x1 is a vector of length n, from 0 to 1 with step 1/(n-1)
    $x2 = zeros(1, n)$       // initialize a vector of zeros with the same length of x1
    B = sorted($x$)          // in ascending order
    $idx = m * x1$
    $idx = round(idx)$       // index of samples
    $i = 1$
    While ($idx(i) == 0$)
            $idx(i) = 1$
            $i$++
    End While                // make sure indexes are not out of bound
    $idx(n) = m$             // last sample is the maximum value
    For i = 1:$n$
            $x2(i) = B(idx(i))$
    End For                  //x2 is the vector of samples
    minv = $x2(1)$;          //first element is the minimum value
    meanv = mean(x2);        //mean value of samples
    //log-scale x2
    For i = 1:$n$

            Compute      $x2(i) = 1 - e^{\frac{x2(i) - \mathrm{minv}}{\mathrm{minv} - meanv}}$

    End For                  // if x2 now is uniform distributed, x is exponential distributed
//later is the KS test, test whether x1 and x2 have the "same" distribution
max_d = 0
For $i$ = 1:$n$-1
    If (abs($x2(i) - x1(i)$) > max_d)
            max_d = abs($x2(i) - x1(i)$)
    End If
    If (abs($x2(i) - x1(i+1)$) > max_d)
            max_d = abs($x2(i) - x1(i+1)$)
    End If
End For
If (abs($x2(n) - x1(n)$) > max_d)
    max_d = abs($x2(n) - x1(n)$)
End If
en = sqrt($n$)
prob = probks((en + 0.12 + 0.11/en)*max_d)
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    If (prob > 0.3)
        H = 1
    Else
        H = 0
    End If
    Return H, minv, meanv;
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Sorting is done in ascending order.